2014

NASA Ames Academy for Space Exploration

Academy Profile Book
Ames Research Center
Moffett Field, CA

NASA Ames Academy for Space Exploration
2014 Profiles

Research Associates

Staff

NASA Academy Alumni Association
Official alumni organization for the NASA Academy

LOCKHEED MARTIN

NASA Ames Academy for Space Exploration

Introduction

The NASA Ames Academies are unique summer institutes of higher learning whose goal is to help guide future leaders of the U.S. Space and Aeronautics Programs by giving them a glimpse of how the whole system works. NASA's success is a result of the interaction between government, academia, and the private sector, each playing a critical and different role in the 56-year-old civil program. Responsibilities overlap, leaders migrate from one sector to another, and interdependence changes with each new administration.

NASA's Charter, written in the 1958 Space Act, gives NASA the main role of using and exploring space for the betterment of humankind while developing technologies which benefit life on Earth. Congress and the President have both supported and restrained NASA as its programs have evolved. President John F. Kennedy's vision of putting a man on the Moon within the decade included much more than the Apollo spectacular of newspaper fame. After Apollo's success, NASA has constantly sought to redefine its goals and fine-tune its schedule every year while seeking a budget to match its imagination. We have explored most of the planets, measured the solar system, flown humans in long-term endurance missions and short-term operational missions, invented new technology, and trained Congress, teachers, students, business people, and engineers, developing a whole new generation familiar with the expertise of the "Space Age."

The NASA Ames Research Center

The Ames Research Center (ARC), located at Moffett Field, California, in the heart of Silicon Valley, specializes in revealing new knowledge about the universe, planetary systems, and life science and in creating new technologies that enable exciting new ventures in aeronautics and space exploration. Throughout its history, results from research at Ames have significantly influenced national and international policy, enabled most of the major space missions of the past thirty years, and contributed science discoveries and engineering insights that have rewritten the textbooks. In the process of these endeavors, Ames has made numerous contributions to environmental protection, public health, and the nation's economic well-being.

Ames is unique in having world-class ground, airborne, and space flight research capabilities in aeronautics, astrophysics, earth sciences, astrobiology, fluid dynamics, gravitational biology, thermal protection technology, computational chemistry, planetary atmospheres, space laboratories, information sciences, and spacecraft life support.

As a result, Ames supports all aspects of the NASA vision to expand human presences to the Moon and eventually to Mars and acts as technical bridge to transfer skill, knowledge, and technologies among the NASA activities. This multidisciplinary synergy has created the world's only capability for the comprehensive study of Astrobiology -- life's origin, evolution, and distribution in the universe and destiny, from the protection of our planet to the evolution of terrestrial life into space.

Ames is the lead Center for understanding the effects of gravity on living things. Ames plays a major role in understanding the origin, evolution, and distribution of stars, planets, and life in the universe. One important activity is Ames' unique research in atmosphere and ecosystems science in support of Mission to Planet Earth and the protection of the global environment. In space technologies, Ames is also the lead Center in providing the thermal protection systems that are critical for future access to space and planetary atmospheric entry vehicles. Ames is NASA's Center of Excellence in Information Systems Technologies, encompassing research in supercomputing, networking, numerical computing software, artificial intelligence, and human factors to enable bold advances in aeronautics and space.

Ames leads the Agency in virtual institutes as the NASA Astrobiology Institute, the NASA Solar System Exploration Research Virtual Institute and the NASA Aeronautics Research Institute are located here. The virtual institutes combine diverse interdisciplinary collaborations with international partnerships, training of the next generation of researchers and education and public outreach in order to push the boundaries on their respective sciences. All Institutes have been very influential with the NASA Academy through training and support of students in the program.

In aeronautics, Ames is the Agency's lead Center in airspace operations systems, including air traffic control and human factors, and the lead Center for rotorcraft technology. Ames also has major responsibilities in the creation of design and development process tools and in wind tunnel testing.

About 1600 civil servants and over 2000 contractor personnel are employed at Ames. In addition, Ames is proud to host more than 500 graduate students, cooperative education students, post-doctoral fellows, and university faculty members who work in collaboration with Ames' preeminent scientists and technologists.

Ames is a pioneer in the application of the multidisciplinary approach in science, technology, and projects, that is, combining the perspectives, training, and technologies of a variety of disciplined experts to attack problems of exceptional difficulty. Multidisciplinary approaches are flexible and tend to stimulate cutting edge concepts. Successful application of this technique requires a deep appreciation for the talents, skills, and insights of others and ability to cross organizational lines to reveal hidden treasures of understanding. Today, more and more scientists and high tech industries are using this approach with remarkable results.

It is in this spirit of shared discovery and the synthesis of diverse talents that Ames offers the NASA Academy at Ames. Students will contribute to every aspect of successful multidisciplinary research on Earth, in the air, and in space, from the formulation of an idea to the procurement of goods and services necessary to develop it, through the management, marketing, and manufacturing necessary to turn a concept into a reality.

The Academy

One goal of the Academy is to provide insight into all of the elements that make the NASA missions possible, while at the same time assigning the student to one of our best researchers to contribute towards one of our missions. Each student will be handpicked by a series of gates -- panels, interviews, etc., starting with their own State Space Grant Consortium who has selected and agreed to sponsor them. The researchers at Ames are selected to provide a diverse set of tasks that cover all aspects of on-going work at the Center. The "match" between student (Research Associate) and researcher (Principal Investigator) will be done by mutual selection.

Seventy percent of their time at Ames will be spent in the laboratory of the selected Principal Investigator assisting in research. About thirty percent of the working time and most of the social time of the students will be spent as a "group" or "team" in plenary sessions. This time will be devoted to exchange of ideas, on forays into the highest level of decision making, prioritizing, planning, and executing our space missions. This will be done by interviews with leaders and motivators of the space and aeronautics programs. Besides the domestic Ames' experts, we will bring in leaders from the aerospace, high-tech, and genetic engineering firms in Silicon Valley, local, state, and national political decision makers, international partners, advocates and adversaries of space exploration.

Activities – June 16th – August 22nd

These dates were selected to give most students a breather before returning to school. We know this is a compromise, as no two schools have identical schedules. **It is important that the students begin together and all end together.** The success of this Academy depends not on us as much as all of the students. **We do not accept people who are not able to attend this entire period. All students must be U.S. citizens or hold a "green card." Specific exemption may be made if a national space agency is involved.**

Our intention is to assure that the students interact as a "team." We will always try to spark their leadership qualities. While we encourage the students to stay together as much as possible, we do not want them to feel trapped. All students will be housed a short drive from Moffett Field with transportation is provided each day.

The west coast offers various unique opportunities for group activities including local trips to Lick Observatory, Monterey Bay Aquarium Research Institute, and Space Systems Loral among other destinations. The selected students will plan additional weekend trips when they arrive which have included in the past trips to NASA Centers, such as the Jet Propulsion Laboratory and Dryden Flight Research Center. Each of the ten weeks will be a unique group experience, but at the same time, the students will be working on a research project with Investigators in the Ames' laboratories or on our flight projects.

The Academy Experience

These past 16 summers, 11 - 15 students from all over the U.S. who were interested in life, space, or Earth sciences, space technology, space engineering, or aeronautics were selected for the 10 week session to share a unique experience resulting from their own ingenuity and free spirit. Teaching and learning are not the same. Teaching is the orthodoxy of our universities and colleges; learning is the "ah-ha!" process of finding out and understanding. That is our objective: to foster curiosity, to spirit endeavor, and to inspire leadership.

All of these elements make the Ames Academies a unique experience that will last a lifetime. Students not only participate in the Academy, but are inducted into the larger Academy Family through the NASA Academy Alumni Association (NAAA). It's been said many times by Academy students in the past, and we're sure it'll be true again this summer: "This has been the best summer of my life!!"

Student Support

The NASA Academy program is co-sponsored by the participating NASA Center and the National Space Grant College and Fellowship Program. Most State Space Grant Consortium offices, as well as the Space Grant offices of the District of Columbia and Puerto Rico, support the program. Please check with the Space Grant office in your State for participation information. Space Grant Consortia offices agree to provide the students with summer stipend support and round-trip transportation to and from the participating NASA Center. The participating NASA Center agrees to host the student, providing housing, local transportation, and meals. More information on the National Space Grant College and Fellowship Program is found at: http://www.hq.nasa.gov/spacegrant/

Student Eligibility

- Demonstrated interest in the Space Program
- Enrolled as a junior, senior, or graduate student (as of June 1 of the program year)
- Maintain an overall B plus average
- Majoring in science (physics, chemistry, biology, etc.), math, engineering, computer science, or other areas of interest to the space program
- Be a US citizen or permanent resident (as of June 1 of the program year) or be sponsored by a participating space agency

Contact Information

NASA Academy information is obtained through these sources:

NASA Academy Alumni Association: http://www.nasa-academy.nasa.gov/
NASA Ames Academies: http://academy.arc.nasa.gov

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2014 Research Associate Profiles

Michelle Brann

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Growing up in a small rural town on the coast of Maine, I have always loved spending time outside with nature and star gazing. I remember first being introduced to space and its exploration in high school when I participated in the astronomy event for Science Olympiad. I signed up for this event on a whim unsure of what to expect, but over the course of weekly meetings I became hooked and wanted to learn about these foreign objects in the sky. I continued learning about astronomy through this event for my remaining three high school years. I also studied Delta Cephei, a variable star, for my science fair project.

Leaving my twin brother, parents and the house I grew up in behind, I traveled to Wellesley, Massachusetts, outside of Boston, to attend college. I entered college as a pre-med and a biochemistry major. It wasn't until after I suffered through cellular physiology and genetics courses with laboratory that I reaffirmed my love of numbers and equations. Needless to say, I am currently studying chemistry and math. Additionally, throughout my time at Wellesley, I have been involved in independent research in Professor Adele Wolfson's Lab. I work to understand the complex interactions involving hormones DHT, GnRH as well as Thimet oligopeptidase (TOP), a compound found in high concentrations in prostate cancer cells as these cells change from being androgen responsive to unresponsive over the course of the cancer. I love that small bumps in the road in research can lead to unexpected paths. I am no longer pre-med with plans to pursue graduate school after Wellesley.

When I am not conducting experiments in my research lab, I enjoy spending time outside. I am a member of the division III varsity golf team at Wellesley. I use golf as a way to relax from the stressful schoolwork environment, as well as learn important time management, leadership and teamwork skills that are applicable to everyday life. I enjoy the close bond I have with my teammates, as well as competing in tournaments. Coming from Maine, I also have a fond appreciation for snow and downhill ski with my family every winter.

Last summer, I was fortunate enough to combine my outside passion, astronomy, with that of my previous lab experience in molecular biology to intern in Dr. Oana Marcu's astrobiology lab at NASA Ames Research Center. I can say without any doubt that it was the best summer of my life. I was surprised by how passionate all of the NASA scientists were about their work, specifically my wonderful mentor Oana. The environment fostered a sense of self-discovery. I learned that it is feasible to connect biology and chemistry research with that of space to explore fundamental

questions and make it possible to search for life elsewhere. I became familiar with the term “astrobiology.” As scary as it sounds, I enjoy studying space from a biological and chemical environment because it makes me realize how small we really are.

I am thrilled to be given the opportunity to return to NASA Ames as part of the NASA Ames Space Academy. I am excited to continue my project in Dr. Oana Marcu’s lab while learning more about the NASA agency in detail. I hope that this summer will confirm that my academic interests can be applied towards a career in the space industry. I look forward to meeting and learning from all of the other research associates and staff members in the Academy.

Brennan Chung

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About Me

I was born in the outskirts of Cincinnati, Ohio and raised in Terre Haute, Indiana. My parents are both chemical engineers and I found out when I was young that I absolutely hated chemistry, but loved building and taking apart things. I spent my years in high school participating in science fairs, math competitions, and chess tournaments. I was recently bitten by the electronics bug, and I have bought several microcontrollers and a Raspberry Pi, with plans (time allowing) to get into hobby robotics. At Rose-Hulman, I joined a few interesting clubs including EcoCar2, the Robotics club, and the aerial Robotics club.

Space exploration has always been an interest of mine, the limitless potential that still awaits us both within our own solar system and beyond is the main reason for my interest in NASA. When I was offered the opportunity to attend the Academy I was ecstatic. The chance to contribute to the decades of excellence at NASA is a once-in-a-lifetime opportunity. I hope to meet many like-minded people, to expand my knowledge, and to have an amazing summer experience.

Education and Research

I am graduating May, 2014 from Rose-Hulman Institute of Technology with a BS in Mechanical Engineering and a minor in Robotics. To date, I have completed two internships, one at Rose-Hulman Ventures designing and prototyping biomedical devices for use in brain surgery, another at the Marshall Space Flight Center building scientific devices for use on the ISS. I am currently building a delta robotic system for a professor at my university to be used in classroom demonstrations. My senior design project is to make a device that will autonomously paint the lines on a baseball field for our client.

Hobbies and Interests

I love designing, tinkering, and hobby robotics. A few of my future projects include a quadcopter, homemade rapid prototyper, and small robotic arms. I have also been playing around with android app development, personal computer construction, and microcontrollers. Outside my technical interests, I love camping, reading, and hiking.

Future Plans

I plan to get my Master's degree in Mechanical Engineering and then possibly a PhD. Once I leave the academy, I would love to work on challenging engineering problems at NASA.

Jiro Funamoto

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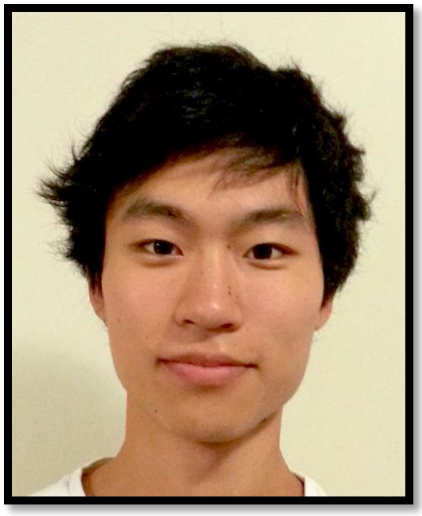

I was born and raised in Australia to a Korean mother and a Japanese father. I recall that in my younger years, I always enjoyed making toys out of wood, rubber bands, electronics, and anything I could find around the house. When asked what I wanted to become, I would always answer an inventor. Physics and chemistry in high school taught me that it was possible to characterize the workings of the world in a much more systematic way. I was quickly attracted not only to the beauty of the world, but also in its potential to unlocking ideas previously unimaginable. I naturally headed in the direction of engineering and science.

I attended the University of Sydney where I studied Aerospace Engineering and Advanced Science. During my degree, I was fortunate to have been able to do research in a large number of fields. In technology, I experienced satellite systems engineering, photonic technologies for telescopes and medical applications, and the development of miniature plasma thrusters for nano-satellites. In science and theory, I worked on the foundations of quantum mechanics, the analysis of complex plasmas, and the theories of baryogenesis and theoretical particle physics, on which I wrote my honours thesis.

My interests include solving problems that are widely applicable and useful, and require creativity in bridging the problem to a solution. I believe such general interests can be fulfilled in both theoretical and experimental/developmental realms. My research this summer at NASA Ames on new techniques in predicting earthquakes is of such a characteristic. Of special interest is the reinterpretation of the abstraction in some current theories. I also enjoy music, and drawing life and scenery.

Matthew Jadusingh

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I don't know any other way to start this off other than by expressing my tremendous excitement to be participating in the Ames Space Academy this summer. I hope to establish a career defined by contributions to space-exploration, and this NASA Academy is an incredible opportunity to help realize that goal.

Prior Work Experience

I graduated from The Johns Hopkins University in 2008, and I worked in Washington, DC for four years before deciding to return to school. During my time in DC, I served as a proposal writer, and as an Operations and Communications Manager for a large Federal IT consulting firm. As a proposal writer, I was involved in writing winning proposals for contracts valued in excess of $100 million. In my role as Operations and Communications Manager, I established and administered document handling policies, developed company-wide newsletters, maintained websites and other IT systems, developed employee morale programs, and prepared and presented monthly operational reports on over 600 projects across the U.S.

Current Education and Research

I have always been interested in space exploration, and this interest has only intensified over time. I came to realize that simply being a spectator in this field would never be enough, so I decided to return to school to equip myself with the knowledge needed to not only pursue, but also positively impact, the space exploration mission. I chose mechanical engineering because it is such a widely applicable field of engineering that provides me with a great technical foundation from which to specialize through graduate education.

At RPI, I'm involved in research at our Center for Flow, Physics, and Control (CeFPaC). My research involves understanding and manipulating air flow within compact diffuser inlets used on jet engines for Unmanned Aerial Vehicles (UAVs). Through our research, we are developing both active and passive flow control mechanisms to reduce flow separation/reattach separated flow, as well as reduce or eliminate unwanted secondary flow structures that develop as a result of the geometry of the compact inlet. If successful, we will develop prototype devices that will serve to reduce the overall size profile of UAVs while increasing their engine performance. My role on the project so far has been to develop the CAD designs and to perform the actual physical assembly of a new high-subsonic (Mach 0.8) wind tunnel developed specifically for this project, to design and install various

measuring equipment for use in the wind tunnel experiments, and more recently, to assist with the analysis and reporting (to our corporate sponsor) of the data gathered from our experiments.

Prior to my research at CeFPaC, I worked as an engine quality control intern for Hyundai Motor Manufacturing Alabama (HMMA), where I performed engine inspection and testing. While at Hyundai I also developed processes and software code to automate much of the reporting surrounding engine data, reducing the time required to produce such reports by as much as 75%.

Looking Forward

Having the chance to be a part of the Academy this year is an absolute dream come true. I came back to school solely to be in a position to learn about and contribute to the space exploration mission, and there is no better place to do that than at NASA. I'm looking forward to getting involved in a technical project, learning more about how NASA operates as an organization, and working with and learning from my mentor(s), my fellow Academy students, and all the experienced staff at ARC.

Random Facts about Me

- I'm originally from Kingston, Jamaica
- At one point in my childhood, I had 11 dogs
- I play cricket, soccer, and lacrosse
- Before the Academy, I had never been to California.

Nicole Leong

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Since my early teenage years, I have been fascinated with the fields of aviation and aerospace. This interest led me to pursue a university education at Embry-Riddle Aeronautical University (ERAU), widely regarded as the world's leader in aerospace education. Situated relatively near the university in Florida is the Kennedy Space Centre, which has afforded me the privilege of viewing several launches 'live'. At ERAU, I completed my undergraduate career in Aeronautics with minors in Aeronautical Studies, Air Traffic Control, and Business Administration. I was also a member of the Honors Program, working on several research projects with faculty on topics such as turbines in aircraft engines, quantitative methods in mathematics, and runway excursions in air traffic management. Currently, I am pursuing a graduate degree in Aviation Finance at ERAU, while employed as a research assistant to selected business faculty.

Besides attending class and doing research, I am a private pilot working on my instrument rating. As a member of ERAU's Eagles Flight Team, I have been given the opportunity to represent the university and participate in various regional and national competitions organized by the National Intercollegiate Flying Association. I am also a member of Women in Aviation International, and recently attended the annual conference in Lake Buena Vista, Florida.

I am extremely grateful to NASA for allowing me to be a part of the Academy and very much look forward to it this summer, I expect that it will be an experience to remember for life.

Cooper Matthieson

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From a young age, I was captured by math and science (and Lego's) and how definitive they were. You couldn't quite solve a sentence's structure like you could solve a math problem. These interests only grew as I took more math and science classes. During my junior year in high school, I was accepted into the Apprentice Researcher's Program at UC Santa Barbara to assist a materials science PhD candidate with her research during the summer. This was my first exposure to what engineering was really like, and it seemed like the perfect fit for me. It combined all of my interests and gave me so many opportunities to thrive. With that, I began applying to engineering programs and was accepted early to Columbia University's School of Engineering and Applied Sciences.

At first, I didn't know exactly what I wanted to study so I dabbled in as many disciplines as I could. I took classes in physics, math, chemical engineering, environmental engineering, and mechanical engineering. Eventually, I focused in on mechanical engineering because of how it fosters creativity and design ingenuity, along with giving me a lot of options after school.

Now where does aerospace engineering fit in? During my sophomore year, I went to a TEDx talk by NASA astronaut Michael Massimino about his time at NASA and being in space. I can't remember being more riveted than hearing about what he got to do and how he almost broke the Hubble Space Telescope. Up until this moment, it had never occurred to me that aerospace engineering and potentially becoming an astronaut were things I could pursue. Once the seed was planted, my fascination with space and aerospace engineering only flourished. I've been very fortunate to get to know Mr. Massimino better, as he's become a professor in the School of Engineering and Applied Sciences at Columbia and a great mentor.

That brings me to where I am now. As a junior, I'm currently enrolled in Mr. Massimino's class, Intro to Humans in Space Flight, which is an absolute blast. We learn about each aspect of space exploration and how they all work together from a systems engineering standpoint. We are also working on a project to improve the NASA Crew Earth Operations (CEO) project interface so that astronauts on the International Space Station have an easier time identifying targets they need to take pictures of. I couldn't be happier getting the opportunity to further my passion for space exploration this summer at the NASA Ames Space Academy and I'm looking forward to wherever it takes me, whether it's graduate school, the aerospace industry, or elsewhere!

Emily McMillon

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Since I grew up in Lumberton, Texas, a suburb of Beaumont, Texas, in the southeastern corner of the state. Like others in the Academy program, I showed interest in space exploration and astronomy at an early age. Frequent school field trips to Johnson Space Center, a mere ninety minute drive from my small hometown, fed my interest level. I never wanted to be an astronaut as a child, but instead wished to work more behind the scenes in mission control or in a science or engineering field. I've always been especially interested in planetary science and astrobiology.

I had my first official experience with NASA during my junior year of high school through the High School Aerospace Scholars program. This involved doing online lessons, quizzes, and projects. The following summer, I and a group of other program participants worked together for a week at Johnson Space Center to design a mock manned Mars mission. The project split us into four team groups where each group worked on a specific aspect of the mission. My group was tasked with studying the habitability of Mars and designing living arrangements. This experience instilled in me an appreciation of the collaborative and design aspects of engineering and was the primary factor that led me to study engineering in my undergraduate studies. I loved the experience, and it led me to participate in the INSPIRE online learning program the following year. Through INSPIRE, I did a summer internship at Johnson with Lockheed Martin between my senior year of high school and first semester of college where I got exposure to systems engineering and the contractor/NASA relationship.

My first year of college, I became involved with my university's Microgravity Flight Team. Our experiment was selected, and I had the incredible opportunity to fly on the Weightless Wonder. My team proposed, designed, built, flew, and analyzed the final data of an experiment on the effect of electric fields on water droplets in microgravity. This was my first taste of the research experience. I was the primary writer for the proposal and technical report, and got experience in those areas much earlier than many of my peers. Following the project from proposal to flight to the final report gave me an appreciation for the research process as a whole, and made me realize just how difficult putting together an experiment from scratch can be. (Side note: the flight experience was incredible!)

In spring of 2013, I interned at Glenn Research Center and worked with polyimide aerogels under my mentor, Dr. Mary Ann Meador. This experience was life changing for me in that not only did I

undertake life on my own in a big city for the first time, but I experienced a true research setting. I handled polyimide aerogels from fabrication to testing, and loved every second of the process, down to writing the report at the end. More than the actual research and work, I loved the environment at Glenn. I find the idea of a community of researchers working together to make progress toward bettering their fellow man immensely satisfying, and I felt this at Glenn. This experience convinced me to pursue graduate studies.

I am thrilled by the prospect of the Ames Academy, and count myself incredibly lucky to be able to call Ames home this summer.

I am currently a handful of credits away from a Chemical Engineering bachelor's degree, which I will complete in the 2014-2015 school year. I plan to attend graduate school in 2015. Someday, I hope to be able to call myself a civil servant.

Outside of school, I enjoy swimming, running, watching television, and playing video games.

Yoh Nagasaki

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Education and Experience

I am in the graduate school of engineering at Kyoto University as a Ph.D. candidate, where I am developing the system of a magnetic sail spacecraft, which is one of the sail propulsion systems for future deep space explorations, with a research group at Japan Aerospace Exploration Agency (JAXA). I earned a B.S. in electrical and electronics engineering from Kyoto University in 2011, and I received an M.S. in electrical engineering from the graduate school of Kyoto University in 2013. I have studied the superconducting magnet installed in the magnetic sail spacecraft from both theoretical and experimental perspectives, and successfully improved the obtainable propulsive force from the magnetic sail by optimizing the configuration of the installed magnet. I have currently focused on research and development of the system of the magnetic sail spacecraft from electrical and thermal, as well as structural perspectives in my Ph.D. course at Kyoto University. I have several published research papers as the first author, regarding the analysis and experimental results of the magnet for the magnetic sail spacecraft. I have already made presentations at several international conferences, and I will give an oral presentation at the 65th International Astronautical Congress to be held in Canada this October. I am sure that the NASA Academy program will me with a great opportunity to work with a wide range of people from all over the world, who have the excellent competence and potential as one of the next-generation leaders in the aerospace field. The NASA Space Academy will broaden my perspective and help me build a great team with international talented people.

Future plans

I have been deeply engaged in both of the space and electrical engineering from the analytical and experimental viewpoints. I aim to organize international projects for space development as a researcher in the field of space and electrical engineering. I would like to bring a unique perspective to the space development with use of the broad knowledge about various fields, and globally contribute to the field of space engineering and science by taking part in international projects of the space development.

Jason Swenson

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Since Early Life

For the majority of my life, I lived in Barrington, Illinois – a village northwest of Chicago. Undisturbed by most of the light pollution, growing up in the suburbs was a blessing in my eyes. At a young age, my father and I would spend nights outside scanning the sky for notable star constellations, shooting stars, other planets, and, of course, the Moon. Occasionally, my father would also take my brother and me to astronomy conventions where we could witness the night sky in high-definition. As a child, I also remember standing before the Saturn V at the Kennedy Space Center in complete amazement. Surely, these experiences fascinated me and sparked my curiosity at a young age. What lies beyond us? And more importantly, how can we get there?

I continued through high school and was deeply involved in mathematics and physics. Although I was not studying any space-related courses at the time, I never could let go of my childhood experiences. At the time of college applications, however, I also had an interest in designing skyscrapers and bridges. It was for this reason that I initially was accepted into the Department of Civil Engineering at the University of Illinois at Urbana-Champaign (UIUC). It did not take long for me to realize that I truly wanted to study topics beyond the scope of the Earth. Prior to my sophomore year at UIUC, I followed my childhood dreams and officially became an Aerospace Engineering student.

University

From that moment, my experience and knowledge in the field of Aerospace Engineering grew exponentially. I ventured to Europe to study in Delft, Netherlands at the Delft University of Technology (TU Delft). Here, under the wing of some of Europe's finest aerospace professors, is where I learned a great deal of the science behind space and engineering technology. Following the yearlong venture, I completed my Bachelor's degree at UIUC by designing both the onboard power and thermal subsystems for a 24-satellite swarm. Our team submitted the completed design to the 2012-2013 AIAA Undergraduate Team Space Design Competition and, as an affirmation to our capability and motivation to push the limits of science and creativity, our team was awarded first prize.

Following these years, I continued on to my graduate career at UIUC and surrounded myself with more brilliant students and professors. As a graduate in Aerospace Systems Engineering, I was involved with a deep-space prospecting mission from the Jet Propulsion Laboratory and a Martian UAV request from the Johnson Space Center.

Interests

I have discovered that my interests within the aerospace industry are nearly unlimited. Topics such as rocket propulsion, orbital mechanics, numerical and statistical analysis, and aerospace structures have been just a few of my interests. I would like to learn more about planetary science and astrobiology as well as some of the current studies being conducted using data from NASA's Mars rovers.

Outside the aerospace realm, I have a strong interest in both creating and listening to music. I have played percussion since the age of twelve and have recently been teaching myself guitar. Undoubtedly, my favorite band is Radiohead. I also enjoy travelling and exploring the world around me.

Future Work

After graduate school, I plan on either conducting research or system engineering work for a space/defense company or an organization such as NASA. I strongly feel that the NASA Ames Academy will leave me with the knowledge and leadership skills needed to become a valued leader of the next generation of aerospace engineers and to pave the way for new space exploration opportunities. I am so grateful for this opportunity with the NASA Ames Academy.

Danielle YoungSmith

Barnard College
Astrobiology
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Explore.

This word has been the core of Danielle's character for twenty-one years. Born to two aviation lawyers, one an Army pilot with a flair for adrenaline and the other a world citizen with insatiable wanderlust, Dani was raised for adventure that pushes her to her limits. She treats the world as her classroom and the classroom as her playground where friendships are born, lessons learned firsthand, and collaborative feats accomplished. There is little room for idling in Dani's life, as she grew up with the notion that "if you're bored, it's your own d*** fault!"

This zeal for living and learning has driven Dani to design her own astrobiology major at Barnard, an endeavor that integrates lessons from each piece of her life into her studies. Her science courses are brought to life through research experience with molecular biology and astrophysics at NASA Ames, astronomy at Kitt Peak National Observatory, and geochemistry at the Lamont-Doherty Earth Observatory. Teaching marine conservation was a way to practice zero-gravity spacewalks SCUBA diving in the shark tanks of the Denver Aquarium, and she is building up flight hours toward eventually applying for the Astronaut Corps. She spent two weeks this winter living and working in a simulated Martian Habitat where she conducted field research to analyze the effects of the harsh "Martian" environment on algal and bacterial communities to better understand limits of habitability. She has presented this and her Ames biology work as the sole undergraduate at the international Search for Life beyond the Solar System conference in Tucson, Arizona. She thrives on these experiences and opportunities to interact and collaborate with others in and around the field, and she looks forward to more time doing so at the Ames Academy.

The most attractive part of studying astrobiology to Dani is its vastly interdisciplinary nature both within and beyond science. From microbiology to planetary science, philosophy to business, astrobiology has helped Dani to foster her theater and Speech and Debate skills as well as confounded her with cosmological theory. She looks forward to becoming a part of the Academy, to growing as a leader, a researcher, a professional, and as herself. The Academy will help her build a more comprehensive understanding of the nature of NASA's own exploration missions to determine where her exploratory expertise can best contribute to mission design, execution, and success.

Dani relishes placing herself beyond her comfort zone, seeking adventure both interpersonally and geographically, from the pulsing neon lights of Burning Man to the cave dwellings of Cappadocia (better known as Tatooine) to the Bedouin desert camps of Jordan. Her sights are set skyward for her next adventure.

2014
Staff Profiles

Dr. Brad Bailey

Director for the NASA Ames Academies
NASA Solar System Exploration Research Virtual Institute
Senior Scientist
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Moffett Field, California
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Brad Bailey received his B.S. in physics with minors in optics, chemistry and Japanese from Rose-Hulman Institute of Technology. From there, he received his M.S. in astrophysics from New Mexico Tech where he used the Very Large Array (VLA) to qualitatively analyze spectra from pulsars. After working for 2 years at NASA Ames as a hardware engineer for the International Space Station, Brad went back to graduate school at Scripps Institution of Oceanography in San Diego where he got his PhD in marine microbiology and geochemistry. In addition to being the Director of the NASA Academy, he also acts as the senior scientist for the NASA Solar System Exploration Research Virtual Institute.

In 1998, Brad was accepted into the NASA Ames Astrobiology Academy where he worked with PIs Lou Allamandola and Doug Hudgins on the spectroscopic determination of polycyclic aromatic hydrocarbons in the interstellar medium. He enjoyed the Academy experience so much that he came back in 1999 to work as a staff member for the Academy.

With his varied scientific background, Brad will be a good contact and resource for students looking to break into new fields of interdisciplinary science or for graduate school advice. The Academy was a life changing summer experience for Brad as he would guarantee that he would be working at an optical plant as an engineer in Albuquerque, NM without the experience and contacts that the Academy gave to him. Brad is excited to give back to the Academy in this capacity and is looking forward to meeting all of the Research Associates when they arrive in June!

Dr. Doug O'Handley

Emeritus Director for the NASA Ames Academies
NASA Ames Research Center
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Doug O'Handley is returning for the 15th year with the NASA Ames Academies. He initiated the Academy in 1997. He retired from NASA after forty years in the government and academia in 1999. He currently is employed by Lockheed Martin to continue activities with the Ames Academies.

Upon graduation from the University of Michigan, Ann Arbor, Doug worked for the Time Service and Nautical Almanac Offices of the U.S. Naval Observatory, Washington, D.C. After graduation from Yale University, he joined NASA's Jet Propulsion Laboratory and carried out research in celestial mechanics in support of the early Mariner missions to Mercury, Venus, and Mars. He took the challenge to enter management and led research in artificial intelligence and biomedical technology.

Doug came to Ames as head of the Space Station and Technology Transfer Office in the Director's Office at Ames in 1984. Doug returned to Southern California to work in the private sector at TRW in Redondo Beach in 1986. He joined NASA Headquarters in 1988 as the Deputy Assistant Administrator in the Office of Exploration. This was at the period of planning and the announcement of the Space Exploration Initiative by former President Bush to place humans permanently on the Moon and venture on to Mars early in the 21st century. Returning to Ames in 1992, Doug joined the Space Sciences Division. That is when he started planning for the Academy in 1996.

Doug is a Fellow of the Royal Society of Medicine, a Fellow in the Aerospace Medical Association, a Fellow of the American Astronautical Society, and an Associate Fellow of the American Institute of Aeronautics and Astronautics. In addition, he is a member of the International Astronomical Union and the International Academy of Astronautics, and the American Astronomical Society. He chaired, for 10 years, the Space Exploration Committee of the International Astronautical Federation.

Doug welcomes all of you and looks forward to you becoming part of the extended O'Handley family.

Kristina Gibbs

Program Manager for the NASA Ames Academies
Lockheed Martin Line/Task Manager
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Kristina Gibbs is a Lockheed Martin Manager overseeing the NASA Ames Academies daily operations which includes the responsibility for strategic planning and hiring the Academy staff. In addition to this project, Kristina is the Deputy Project manager for the geneLAB Project and she manages support for other NASA education programs.

Kristina has been working for Lockheed Martin in support of various missions and programs at NASA Ames for nearly 20 years. She spent her first 15 years supporting NASA Ames Life Science Payloads. She first started as a liaison between NASA and the Principal Investigators of the Mir /Shuttle payloads, working collaboratively with Russian Researchers. From 1999 to 2002, Kristina was the Project Scientist for two of the first life science payloads in the ISS. As the first Lockheed Martin employee to manage a NASA payload, Kristina facilitated microbiology hardware development and flight operations. Kristina has supported over 10 Mir, STS and ISS payloads and over 20 Principal Investigators.

In 2009, Kristina was appointed as Manager to the Lockheed Martin Institutes and Collaborative Technologies section. In this role she managed staff and task for the virtual institutes at NASA Ames; NASA Astrobiology Institute, NASA Lunar Science Institute/Solar System Exploration Research Virtual Institute and the NASA Aeronautic Research Institute. Support includes science program management, virtual collaboration technology, education and public outreach, and administrative support. At this time she also took management responsibility for the NASA Ames Academies.

Kristina is looking forward to your arrival and working with you this summer.

Desireemoi Bridges

Deputy Director for the NASA Ames Academies
Lockheed Martin Purchasing Support
NASA Ames Research Center
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Desireemoi Bridges is the Program Coordinator for the NASA Ames Academy for Space Exploration. Desi has had a hand in coordinating all the operational needs of the 2009-2014 Academies. She gets things done efficiently and with minimal collateral. Desi is available to help you and the staff with any logistical issues.

Desi joined Lockheed Martin five years ago as an administrative assistant. In addition to working with the NASA Ames Academies, she is supporting the NASA Aeronautics Research Institute and working as a program coordinator for geneLAB. Prior to working with us, Desi was employed as a funding specialist and software tester in the mortgage industry.

Desi looks forward to working with all of you.

Lynn Garrett

Staff Assistant for the NASA Ames Academies
University of Michigan
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Computer Science
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Experience

When I set my mind to do something, I tend to follow through with it. At the age of eleven, my mom and I challenged each other to go as long as possible without eating meat. Ten years later, I am the clear victor. My passion for space exploration is further evidence of my single-mindedness. When I was in fourth grade, my class took a field trip to Space Camp in Huntsville, Alabama at the end of our unit on astronomy. After experiencing 3 G's in the GForce Accelerator, I was convinced that I had what it took to be an astronaut. Though I strayed from that specific career path, my fascination with outer space remains to this day.

I was born and raised in Louisville, Kentucky, the eldest of four children, and I think both of these facts are reflected in my interests and personality. I've always been told that I have a bit of a motherly personality, comments doubtlessly fueled in part by my love of knitting. My city, on the other hand, is solely responsible for my greatest obsession: University of Louisville basketball. Overall, I consider myself to be a friendly and easygoing person -- perhaps another symptom of my Southern upbringing.

Professional

I am a recent graduate of the University of Chicago, receiving degrees in Mathematics and Computer Science. Beyond my academic pursuits, I was the captain of the Women's Club Lacrosse Team and was a Resident Assistant (RA) in the housing system. In the summer of 2012 I had the opportunity to intern at Goddard Space Flight Center on the Joint Polar Satellite System (JPSS) Ground Project and last summer I worked on research on small satellite development at Ames as a member of the 2013 Academy for Space Exploration. After staffing the Academy this summer, I am starting my PhD in Computer Science at the University of Michigan in the Fall.

Karl Gendler

Staff Assistant for the NASA Ames Academies
University of Michigan
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Space Engineering
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Education and Experience

As a small child, my mother used to take me to the library every other week. Each time without fail, I would manage to squirm my way out of her grip and dash off to the science section. Mom only let me check out three of the veritable mountain of books, but I always knew I would be returning soon to fish out the next three. And the next. And the next.

I'm extremely lucky to have retained this same excitement and passion for learning through all my years in academia. It is because of this passion that I joined S3FL, a student-run laboratory dedicated to hands-on space-systems engineering. Through this group, I've absorbed a great deal of basic engineering knowledge, including knowledge of electronic systems, integration, higher level coding, and much more. Seduced by the prospect of new knowledge, I've gathered outside experience with hovercraft fabrication, wind turbine design, and automotive restoration, falling in love with the design and creation aspect of engineering.

This past summer in the Academy was my first brush with true research. Through the development of a full report on the viability of solar sails as interstellar precursors, I was exposed many differing ideas on what the long-term future of NASA will be, as well as the massive technical challenges that it faces. I hope to expand on this work as I move out into industry.

About the Summer

This past summer in the Academy was, without a doubt, the best summer of my life. Not only did I learn more about NASA and the space exploration community than I thought there was to know, I also gained many incredible friends and contacts in so many different fields. This summer, I look forward to honing my leadership and management skills even further. The Academy has provided me with the opportunity for incredible professional growth; I will be taking full advantage.

The Future

In the fall, I will be returning to the University of Michigan as a graduate student, pursuing a Master's Degree in Space Engineering. I will be looking for a job in industry following my graduation. Beyond this, my future holds endless possibilities. I have considered spending time in public office to address political science literacy, or possibly returning to academia as a teacher or professor after I've done my time in industry. After all, the world can never have too many good teachers!

Abigail Sherriff

Staff Assistant for the NASA Ames Academies
International Space University
Strasbourg, France
Space Studies
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My History

For the first 18 years of my life, I lived in rural Tennessee an hour north of Memphis, 20 minutes from the nearest gas station, and 30 minutes from school. For those years, I was surrounded by wilderness, animals, and an expanse of stars. Along with this early appreciation for the stars, my father used to let me stay up past my bedtime just to watch Stargate SG-1. From this show, I caught the excitement of exploring space and knowing the science behind travelling space. My mother would tell me stories of how I used to imagine that the car was a spaceship traveling through deep space with the only life support being the air in the car. In addition to this great interest in space, when I flew for the first time at 5, I knew I loved to be in the sky, so I knew I wanted to learn more about airplanes and how they fly. This young interest has stemmed into a desire to join the aerospace industry. Since starting my schooling, my interest in and love for the aerospace field has simply broadened. Throughout my time at Mississippi State University, this interest was broadened and cultured. Furthermore, last summer, I was given the opportunity to be a part of the 2013 NASA Ames Aeronautics Academy. My experiences and all the friends and connections that I made collaborated to make it the best summer of my life thus far.

My Interests

Outside of the usual interests that go along with being an aerospace engineer, I have many other pastimes and interests. These range from reading to playing the trombone. Every night before sleeping, I read some. My favorite books have been The Hobbit, the books of the Lord of the Rings trilogy, and the books of A Song of Ice and Fire series. Also, I absolutely love to travel. When I was young, my family used to travel somewhere every year. In high school, I got the opportunity to travel to France and England one summer, and since then, I have been travelling all over the world at every possible chance.

My Future

Having graduated from Mississippi State with a BS in Aerospace Engineering, I will now be going on to the International Space University in France to obtain my Master's degree in Space Studies over a one year, grueling term. With this degree, I plan to work with advancing the field of human space exploration. Another possible route is to work with highly maneuverable fighter and spy aircraft. However, whatever area I end up in, I know that I will be happy with just about anything in the aerospace industry.